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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/634,342      | 08/05/2003  | Thomas E. Drake JR.  | 1017.P051USC1       | 6153             |

7590 11/18/2004  
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EXAMINER

LEE, HWA S

ART UNIT PAPER NUMBER

2877

DATE MAILED: 11/18/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

|                              |                                      |                                     |  |
|------------------------------|--------------------------------------|-------------------------------------|--|
| <b>Office Action Summary</b> | <b>Application No.</b><br>10/634,342 | <b>Applicant(s)</b><br>DRAKE ET AL. |  |
|                              | <b>Examiner</b><br>Andrew Hwa S. Lee | <b>Art Unit</b><br>2877             |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 07 September 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

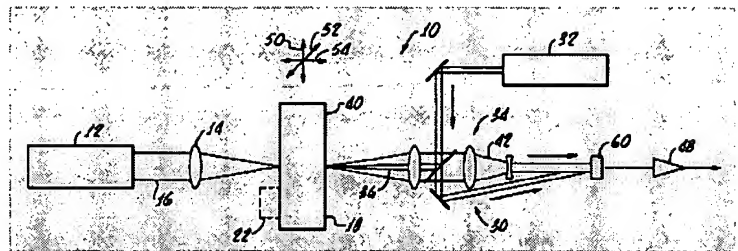
A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

1. Claims 1, 4, and 7 are rejected under 35 U.S.C. 102(a) as being anticipated by Klein et al (US 6,008,887).

Klein et al (Klein hereinafter) show an apparatus and method comprising:

using a first pulsed laser beam  
(16) to generate ultrasonic surface  
displacements on a surface of the  
remote target;



using a second pulsed laser beam (36) coaxial with said first pulsed laser beam to detect  
the ultrasonic surface displacements on the surface of the remote target;

collecting (34) substantially 100% of phase modulated light from the second pulse laser  
beam either reflected or scattered by the remote target; and

processing (48+) the phase modulated light to obtain data representative of the ultrasonic  
surface displacements on the surface of the remote target.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 2 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Klein as applied to claim 1 above and further in view of Schultz et al (US 5,402,223).

Klein does not show the converting of the analog signals to digital signals. Schultz et al show a furnace control system using an interferometer comprising of converting the detection signals from analog to digital signals. At the time of the invention, one of ordinary skill in the art would have converted the analog signals to digital signals in order to electronically analyze the signals by a computer.

3. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Klein as applied to claim 1 above, further in view of Siu et al (6,181,431).

Klein does not expressly show the intensity controller. Siu et al show ultrasonic evaluation system comprising a controlled pulsed laser. At the time of the invention, one of ordinary skill in the art would have used a controller for the laser in order to control the magnitude and pulse of the laser.

4. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Klein as applied to claim 1 above, further in view of Maris (5,706,094).

Klein does not expressly show the wavelength of the laser beam. Maris shows an ultrafast optical technique for the characterization of altered materials comprising of a pulsed laser source having a wavelength of about 10 microns. At the time of the invention, one of ordinary skill in the art would have used a pulsed laser having a wavelength of about 10 microns since Klein is silent about the wavelength and Maris suggests that the wavelength should be about 10 microns.

5. Claims 9, 11-13, 15, 17, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Monchalin et al (US 5,080,491).

Monchalin et al (Monchalin hereinafter) show a laser optical ultrasound detection using two interferometers comprising:

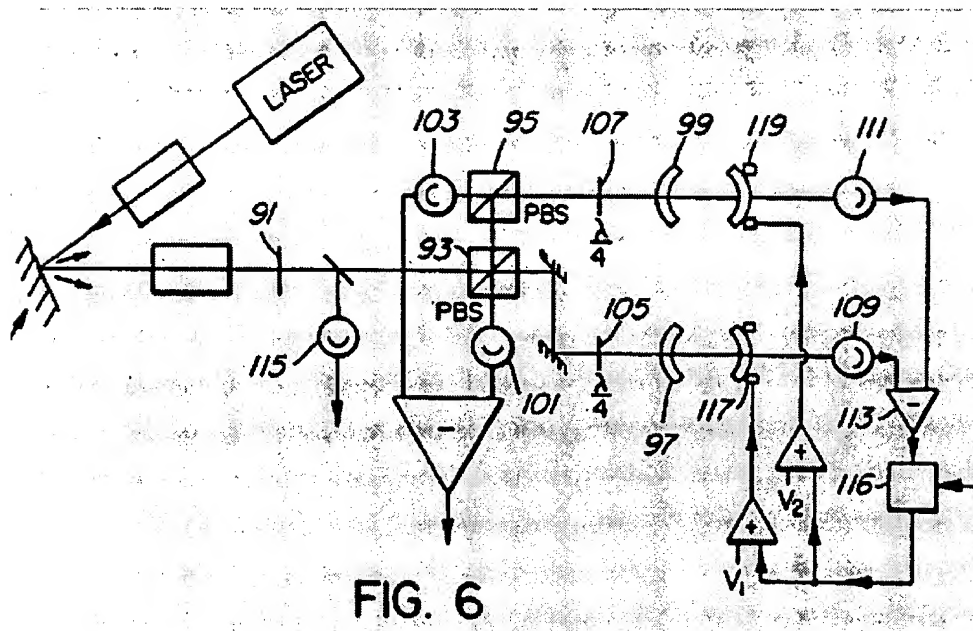
a detection laser to generate a pulsed laser beam to detect the ultrasonic surface displacements on the surface of the remote target; collection optics for collecting phase modulated light from the pulsed laser beam either reflected or scattered by the remote target;

an interferometer to process the phase modulated light collected by the collection optics; said interferometer comprising: a first cavity (97) having a first confocal lens structure; a second cavity (99) having a second confocal lens structure; a device (91, 93) for dividing incoming depolarized light into a first polarized light component and a second polarized light component wherein said device also directs said first and second polarized light components into the first and second cavities;

a control system (117, 119) to adjust said first and second cavities such that a ratio of light transmitted through each cavity to light reflected back through each cavity remains substantially constant.

Monchalin does not expressly show the process but shows the light transmitted through the first cavity, the light reflected back through the first cavity, the light transmitted through the second cavity, and the light reflected back through the second cavity, all in order to obtain data representative of the ultrasonic surface displacements on the surface of the remote target.

Processors are well known and at the time of the invention, one of ordinary skill in the art would have used a processor to analyze the signals.



With regards to the moving of the laser or the sample of claims 11, 12, and 17, it is well known to move either the sample or the target in order to scan the sample completely rather than

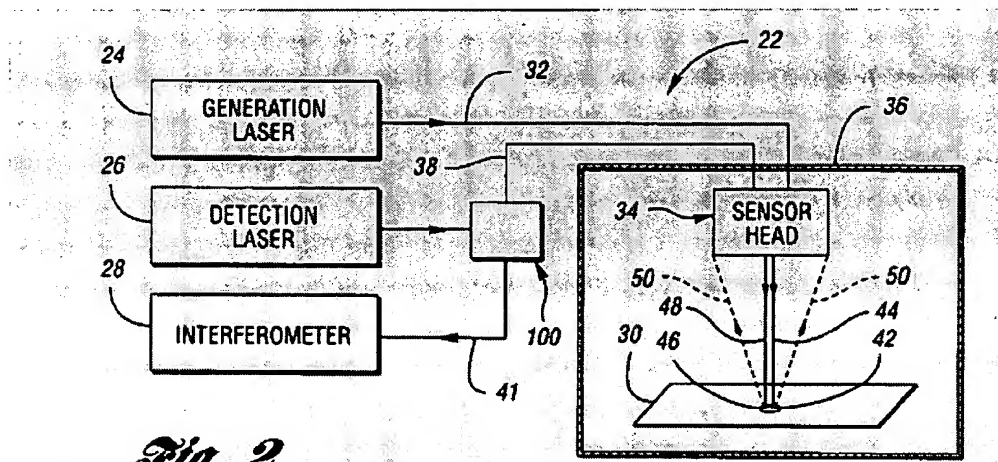
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just a single spot, and one of ordinary skill would have done so in order to evaluate the whole sample.

6. Claim 10 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Monchalin as applied to claim 9 and 15 above, further in view of Siu et al.

Monchalin does not expressly show the intensity controller. Siu et al show ultrasonic evaluation system comprising a controlled pulsed laser. At the time of the invention, one of ordinary skill in the art would have used a controller for the laser in order to control the magnitude and pulse of the laser.

7. Claims 14 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over White et al (US 6,128,081).



White et al show a method and system for measuring a physical parameter wherein the generation laser and the detection laser coaxially apply laser beams to the surface of the remote target. White et al does not show the interferometer comprising: a first cavity (97) having a first confocal lens structure; a second cavity (99) having a second confocal lens structure; a device

(91, 93) for dividing incoming de-polarized light into a first polarized light component and a second polarized light component wherein said device also directs said first and second polarized light components into the first and second cavities.

Monchalin shows an interferometer used for measuring the surface characteristics comprising: an interferometer to process the phase modulated light collected by the collection optics; said interferometer comprising: a first cavity (97) having a first confocal lens structure; a second cavity (99) having a second confocal lens structure; a device (91, 93) for dividing incoming de-polarized light into a first polarized light component and a second polarized light component wherein said device also directs said first and second polarized light components into the first and second cavities; a control system (117, 119) to adjust said first and second cavity such that a ratio of light transmitted through each cavity to light reflected back through each cavity remains substantially constant.

Monchalin does not expressly show the process but shows the light transmitted through the first cavity, the light reflected back through the first cavity, the light transmitted through the second cavity, and the light reflected back through the second cavity, all in order to obtain data representative of the ultrasonic surface displacements on the surface of the remote target.

Processors are well known and at the time of the invention, one of ordinary skill in the art would have used a processor to analyze the signals.

At the time of the invention, one of ordinary skill in the art would have modified White et al to use the interferometer of Monchalin in order to allow ultrasound detection that is immune from intensity fluctuations of the laser and perturbations on the object surface (Abstract).



***Response to Arguments***

Applicant's arguments with respect to claims 1-19 have been considered but are moot in view of the new ground(s) of rejection. However, in response to Applicant's argument that the Klein does not show the first and second beam to be coaxial is unpersuasive. It is of the opinion of the examiner that the first and second beam to share the same axis as show by Figure 1 although it is clear that the first and second beam do not share the same optical path. Furthermore, as presently claimed, "a surface" does not require that the first and second beam share the same surface of the target, but rather only requires that any surface of the target. In addition, although not applied, White et al would meet the limitations of claims 1-8.

Papers related to this application may be submitted to Technology Center (TC) 2800 by facsimile transmission. Papers should be faxed to TC 2800 via the PTO Fax Center located in CP4-4C23. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). The CP4 Fax Center number is 703-872-9306 for regular communications and for After Final communications.

If the Applicant wishes to send a Fax dealing with either a Proposed Amendment or for discussion for a phone interview then the fax should:

- a) Contain either the statement "DRAFT" or "PROPOSED AMENDMENT" on the Fax Cover Sheet; and
- b) Should be unsigned by the attorney or agent.

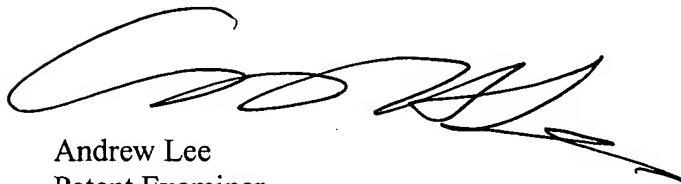
This will ensure that it will not be entered into the case and will be forwarded to the examiner as quickly as possible.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew Hwa Lee whose telephone number is (571) 272-2419.

The examiner can normally be reached on M-Th. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank Font can be reached on (571) 272-2415.

A handwritten signature in black ink, appearing to read 'Andrew Lee', with a stylized, flowing script.

Andrew Lee  
Patent Examiner  
Art Unit 2877

November 4, 2004/ahl